

# Project Notes

Note No. 6  
April  
1998

## Identifying City Infrastructure Priorities

*A FIRE(D) Project Tool*

*As cities in India cope with growing responsibilities and shrinking financial resources, it is becoming increasingly important that cities prioritize their financial investment demands and opportunities. The FIRE(D) Project, together with Kirloskar Consultants, Ltd. and the Centre for Environmental Planning and Technology (CEPT), has developed an approach to prioritizing infrastructure investments which enables cities to better plan and recover costs of urban environmental infrastructure. This approach has been applied in two cities, Vijayawada and Tiruppur, to identify feasible levels of investment and develop investment plan options. This Project Note describes the City Infrastructure Priorities Approach and its application in Vijayawada and Tiruppur.*

### The CIP Approach

The CIP approach is modeled on the strengths of the development of Financial and Operating Plans (FOPs) for the Madras Municipal Corporation which operates on a commercial system with multiple financing options, as well as on the conventional system of accounting as practiced in most other local bodies in Tamil Nadu and other states. An FOP is a tool used in sizing investments given a resource constraint, or in setting the levels of resource mobilization required for a given level of investment. The CIP approach consists of a three phase process.

The first phase, **Situation Analysis**, consists of an assessment of four basic issues: population and growth characteristics; current levels of services, their coverage, and their translation into thematic maps; manpower and management systems in practice; and finances and financial management systems. The second phase, **Gap Estimation and Project Identification**,

includes definition of city needs and goals; quantification of gaps between municipal income and expenditure; conversion of 'goal versus gap' to implementable projects; and preliminary appraisal of projects and benefits. The third and final phase, **Preparation of Financial and Operating Plan**, links each of the modules of Stage II and arrives at a set of projects by determining priority based on sector, investment required, revenue potential, and the feasibility of the project mix.

### CITY CASE STUDY: Vijayawada

Vijayawada is the third largest city in Andhra Pradesh, with a population of 700,000. The city has witnessed rapid growth over the past two decades with an average decennial growth rate of 43.15%. A review of city services revealed that the Vijayawada Municipal Corporation demonstrated impressive success in solid

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waste management and appeared to be meeting the demand for services in a reasonably efficient manner. Several important issues, however, did emerge in relation to water supply. Inadequate storage capacity leaves a substantial number of residents dependent upon public standposts, and low pressure zones have resulted from drawing of water through pumps. Also, there is disposal of sullage into irrigation canals which are used also for drinking water by villages downstream.

- urgency: focus on existing developed areas
- inter- and intra-linkages of services: for example, source development is subject to distribution capacity; the sewerage network is dependent upon the supply of water
- scale of the projects: gap size relative to the need for one, two or multiple projects
- revenue implications: projects involving charges must be timed to meet critical demand

Table 1: Investment Level Options (Rs. Lakhs)

Option	Water Supply	Sewerage	Others	Total
Low	3,989.8	5,132.9	4,666.3	13,789.1
Medium	5,198.8	5,132.9	7,309.8	16,432.5
High	5,132.9	7,155.5	8,472.1	20,760.8

**Finances of the Corporation**

An analysis of the finances of the Vijayawada Municipal Corporation identified several important strengths. The Operating Ratio has been consistently below unity, indicating the ability of VMC to maintain an efficient balance between expenditures and incomes. At the same time, capital income in the form of loans had been negligible, while capital expenditure during the period assessed had been substantial. Strong emphasis was placed on regular repayment of the VMC's loans. While steps were taken to revise the property tax assessment to be levied on the properties and the issue became the focus of legal proceedings, the courts ruled in support of the Commissioner with regard to determining rateable values.

The education sector and others sectors not related to urban environmental infrastructure accounted for over 90% of total capital grants to the city, while capital expenditure had been largely directed towards the public works and roads sectors. The recovery of costs on water supply was low because the majority of the connections continue to be charged at a flat rate.

**Estimation of Gaps and Project Phasing**

Infrastructure requirements in Vijayawada were assessed for a projected population of 1,118,500 by the year 2011. The desired service levels (or norms) for water supply, sewerage, and sanitation sectors were categorized as low, medium, high, and mixed. In the case of other services, norms were fixed based on various relevant attributes.

The gaps in service levels and additional requirements for the projected population were assessed and the investment requirements were estimated using unit costs of provision of respective services (see Table 1). The investment were phased over nine years in three equal phases based on several considerations:

**Financial Viability of Proposed Investments**

A financial analysis of proposed investments was carried out using the FOP module, which indicated that the maximum the Corporation could sustain was a low level of investment. FOPs were generated for two basic operational accounts—water supply and sewerage—on a standalone basis to set the levels of rate revisions incorporated into the General Account, in order to size the investments within a debt service ratio (DSR) of 15-22%. In generating the alternative FOPs, assumptions regarding rates of growth in income and expenditure, as well as recommended rates and charges for water supply and sewerage, were made.

Table 2: Financial Operation Plan, Option 2A

**Investments (Rs. Lakhs)**

Identified	Sized	Percent
13,789.3	9,905.10	72%

**Major Assumptions**

1. Revision of ARV by 50% in 1999 and 2004
2. Revision of water charges by 40% every 3 years, starting 1998
3. Increase water connection deposit by 25% once in 3 years starting 1998
4. Revision of sewage rent from Rs. 25 to Rs. 50/month in 1998, and 50% revision once in 3 years
5. Increase sewer connection deposit by 25% once in 3 years, starting 1998
6. Full transfer of water and drainage tax collected as part of property tax to respective accounts.

Four alternatives were then generated for the VMC within the low level of investment identified. These options represented varying combinations of assumptions regarding revision of taxes and tariffs, ARV, water charges and connection deposits, sewage rent and connection deposits and transfer of water and drainage taxes collected. Table 2 presents Option 2A, the option recommended by the consulting team because it allowed for balanced investments in water supply and sewer systems. Crucial decisions of the VMC will relate to water and drainage tax transfer, as well as revisions of rates and fees as indicated.

### CITY CASE STUDY: Tiruppur

Tiruppur is the second largest town in the Coimbatore district of Tamil Nadu, with a population of 250,000 and is one of the most important industrial and export centers in the state. The rapid growth of its population over the past two decades, with an average decennial growth rate of 52.36 percent, has been attributed primarily to a high rate of industrialization. This rapid

Tiruppur's storm water drainage system was inadequate; with a poor coverage of just 26 percent of the entire road length, the storm water drains serve as disposal routes for sewage water in certain parts of the town. And finally, the spatial distribution of street lights was concentrated only in a few pockets of the town.

#### Finances of the Corporation

In analyzing the finances of Tiruppur Municipality, many issues arose. The Operating Ratio has been consistently below unity indicating the ability of the Corporation to maintain an efficient balance between expenditures and incomes. However, the municipality has been unable to service debt efficiently. While the Revenue Account witnessed a surplus over the years, the Capital Account had been facing a substantial deficit. Revenue Expenditure were primarily directed to the water supply and drainage sector, and public health and sanitation sectors. Revenue through the levy of property tax contributes 36% of the total revenue income of the municipality, and while the current collection performance was commendable at 90%, the collection of arrears had been poor, with only 30 percent being recovered. Capital income and expenditure had

Table 3: Financial Status of Tiruppur under Three Options (Rs. Lakhs)

Option	Revenue Surplus	Accumulated Connection Deposits	Debt Service (% of SGR)
Option 1	1853.00	2745.95	~ 30%
Option 2	726.20	1888.24	~ 25%
Option 3	1757.30	1815.34	~ 23%

industrialization and increasing demand for services has led to the need for improvements in its current infrastructure.

#### Existing Service Arrangements

A number of service gaps were identified. Water supply on alternate days can be characterized as abysmal, at the rate of only 46 lpcd, given the capacity of the town's reservoirs. Intermittent water supply to several areas of the town has been primarily due to inadequate storage facilities. The quality of groundwater was well below the desired standards for domestic consumption. Tiruppur was not served by an underground drainage system. The collection of waste by the municipality was well below the desired efficiency level, and the large number of manufacturing industries and the industrial character of the town is bound to result in the generation of a substantial waste in the future. The northern and peripheral areas of the town were insufficiently covered by a road network, and only 55 percent of the existing road network was surfaced.

been mainly directed towards the water sector as a result of the second water supply scheme.

#### Estimation of Gaps and Project Phasing

Infrastructure requirements in Tiruppur were assessed for a projected population of 3,600,000 in 2006, when the gross density of the Tiruppur Municipal Area is expected to be about 173 persons per hectare. Gaps in service levels and additional requirements for the projected population were assessed using the same parameters as in Vijayawada. Investment requirements for water supply, sewerage and other sectors were calculated, and three levels of investment – low, medium and high – were calculated for water supply.

#### Financial Viability of Proposed Investments

A financial analysis of the proposed investments was carried out using the FOP module and considering three service investment scenarios, which indicated that the maximum the municipality could sustain is a low level of investment. The FOP was generated for two basic

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operational accounts—water supply and sewerage—on a standalone basis to set the levels of rate revisions to be finally incorporated into the General Account, in order to size the investments within a DSR limit of less than 30%. Three investment options were generated for Tiruppur based on varying revisions of rates and charges. Table 3 demonstrates the financial status of Tiruppur under the three options presented.

Based on analysis, Option 3 was sized at 12% of the recommended low level investment option and was recommended as the most feasible in terms of revision of charges. This would also depend upon a measure of state support, such as a special purpose grant, in order to take up the full sewerage project. To absorb an investment level of Rs. 2,766.70 lakhs, Tiruppur would need to pursue the following rate and tariff changes.

### Option 3 Revenue Assumptions

1. Revision of ARV by 50% in 1998 and 2003
2. Revision to water charges by 50% every three years starting 1998
3. Sewer charge per connection per month from 2000 onwards:
  - \* Domestic - Rs. 50
  - \* Non-domestic - Rs. 150
4. Revision to sewer charges by 50% once in three years
5. Sewer connection deposit for new connection:
  - \* Domestic - Rs. 3000
  - \* Non-domestic - Rs. 10,000 and to be revised by 50 % once in 3 years
6. Water connection deposit to be revised by 50% every 3 years from 1998 onwards

### Conclusion

The CIP approach assists municipalities to examine their real situation in terms of population and economic trends, municipal finances and current and projected service gaps. This understanding then enables cities, through a process of prioritization, to develop an urban infrastructure and services development plan which best reflects the city's physical needs, priorities and financial capacities.

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*This **Project Note** is based on two FIRE Project Technical Reports, "City Infrastructure Priorities-Vijayawada" and "City Infrastructure Priorities-Tiruppur", produced by the FIRE(D) Project in association with Kirloskar Consultants, Ltd, Chennai, and the Centre for Environmental Planning and Technology (CEPT), Ahmedabad, under the technical direction of Dr. Meera Mehta.*

## Indo-US Financial Institutions Reform and Expansion Project - Debt Market Component FIRE(D)

The objective of the Indo-US Financial Institutions Reform and Expansion (FIRE) Project, funded by the U.S. Agency for International Development (USAID), is to support the Government of India in its efforts to strengthen domestic capital markets to enable them to serve as efficient source of development finance. The Debt Market/Infrastructure Component (FIRE-D) pursues this goal through the development and financing of commercially viable urban environmental infrastructure projects; by channeling USAID Housing Guaranty funds to selected demonstration cities and states; and through policy advocacy, management support, technical assistance, training and research.

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Funded under USAID Contract

No. 386-0531-C-00-5027-00

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